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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 09/893,314
Filing Date: June 27, 2001
Appellant(s): BLANKENSHIP ET AL.

Susan Wharton Bell
For Appellant

**EXAMINER'S ANSWER**



This is in response to the appeal brief filed April 18, 2005 appealing from the Office action mailed December 21, 2004.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

This appeal involves claims 37-57.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

| | | |
|---|---|---|
| US 6,248,396 B1 | Helf | June 19, 2001 |
| US 3,907,582 | Walter | September 23, 1975 |
| US 5,306,750 | Goodrich et al. | April 26, 1994 |
| US 3,891,585 | McDonald | June 24, 1975 |

**(9) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

Claims 37-47 and 49-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helf (US 6,248,396 B1) in view of Walter (US 3,907,582) and Goodrich et al. (US 5,306,750).

Helf teaches a method of selecting an aggregate, selecting an asphalt, and selecting a polymer (column 2, lines 35-47), heating the asphalt to between about 150 and 200 degrees Celsius (column 7, lines 5-15), adding the polymer to the asphalt to form a binder, stirring the binder until said polymer is substantially dissolved, stirring the binder until a substantially homogeneous binder is formed, mixing the binder with the aggregate to form an interlayer (column 7, lines 55-57), and spreading the interlayer on the roadway. Helf additionally teaches the addition of cross-linking agents (column 5, line 65) and the high viscosity of the binder reads on low shear blending conditions. Helf additionally teaches the overlay (column 8, lines 55-63). As the mixture may be

used as an interlayer or a may be the top layer, this reads on allowing traffic to drive on the interlayer.

The reference fails to teach performing stability and fatigue tests. However, Walter teaches that a Hveem stability test is used to determine the stability of an asphalt mixture so that it meets highway specifications and the results are effected by the amount of asphalt in the mixture (column 2, lines 44-60). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a Hveem stability test. By doing so, one is able to ensure that highway specifications are met. It would have been within the skill of one practicing in the art, through routine experimentation, to determine the amount of asphalt that is needed in order to achieve the maximum stability. This reads on using the stability test to design the interlayer.

Additionally, Goodrich teaches that Flexural Beam Fatigue test is used to determine the fatigue life of an asphalt mixture and that the results are effected by the amount of polymer in the mixture (column 11, lines 60-65). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a Flexural Beam Fatigue test. By doing so, one is able to ensure a long fatigue life of the product. It would have been within the skill of one practicing in the art, through routine experimentation, to determine the amount of polymer that is needed to achieve the maximum fatigue life. This reads on using a fatigue test to design the interlayer.

In consideration of Walter and Goodrich together, one of ordinary skill would recognize that the relative amount of asphalt in the mixture affects the stability of the product and that the relative amount of polymer in the mixture affects the fatigue life of the product. Obviously, as the relative amount of asphalt is increased, the relative amount of polymer is decreased, causing a trade-off between flexibility and stability. It would have been within the skill of one practicing in the art, though routine experimentation, to determine the composition of the mixture such that desired stability and fatigue are achieved. The routine experimentation reads on the applicant's claims. By optimizing the stability and fatigue strength of the product, the final product would have the properties claimed in 38, 39, and 51.

As to claims 42-44, 53, and 54, Goodrich also teaches to determine the shear modulus, strain tolerance, bending creep, and rotational viscosity such that a good quality product is achieved (examples). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to determine these attributes. By doing so, a good quality product is achieved.

As to claims 46, 47, and 49, Wilson teaches cooling between layers and forming an overcoat with a thickness of 1 inch (column 4-41). To use these values in the process taught by Helf would have been obvious at the time the invention was made to a person having ordinary skill in the art. By doing so, one would have a reasonable expectation of success, as both references pertain to coating roads with an overlay.

Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Helf (US 6,248,396 B1) in view of Walter (US 3,907,582) and Goodrich et al. (US 5,306,750), as applied to claim 45 above, and further in view of McDonald (US 3,891,585).

The references mentioned above teach the limitations to claim 45, but fail to explicitly teach sweeping the roadway and sealing cracks prior to applying the interlayer. However, McDonald teaches to sweep the roadway and seal the cracks prior to forming an asphalt/polymer layer on it (column 9, lines 18-41). This is done so that underlying fatigue cracking is not reflected in the new layer (column 7, line 12). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to sweep and seal the cracks in the roadway of Helf. By doing so, the underlying fatigue cracks are not reflected in the new layer.

**(10) Response to Argument**

As to claims 37, 40, and 41:

Applicant argues that since the fatigue and stability are inverse properties, one would not be motivated to optimize both properties. This is not found convincing. Properties being inversely proportional are often optimized together by engineers, such as cost efficiency and materials/energy used, amount of flexible steel added to rigid cement in steel reinforced cement, etc. Even the human body continually optimizes the amount of flexible collagen versus the amount of rigid calcium salts in the bone matrix. Optimization implies an inverse relationship, by maximizing a positive property (stability) while minimizing a negative property (loss of fatigue life) to achieve a desired result. If

an inverse relationship did not exist, then there would be no reason to optimize a system, as the maximum would be sufficient. For the specific case, the prior art teaches a mixture having asphalt and polymer. The prior art teaches that as the relative amount of asphalt is increased, the stability is increased. Obviously, as the relative amount of asphalt is increased the relative amount of polymer is decreased. The prior art teaches that the fatigue is affected by the relative amount of polymer. Thus, the prior art explicitly teaches which components affect what property of the mixture. This is an explicit teaching of result-effective variables in the mixture. The courts have determined that it is obvious to optimize result-effective variables. See *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Although the references may not individually teach to apply both tests, the references taken together make this limitation obvious. Walter explicitly teaches that too much asphalt would cause rutting. Using the Fatigue test taught by Goodrich would prevent one from using too much asphalt.

Applicant argues that there is no suggestion that the selection process should be based on the stability and fatigue performance. This is not found convincing. It would be the duty of any design engineer to meet any design specifications and if the current formulation fails to meet these specifications, to alter subsequent formulations such that they do. What would be the point of testing anything if that data is not used to improved later formulations? Obviously, if the composition did not meet certain specifications, it would be thrown out and a new formulation would be made. Altering subsequent formulations such that they meet a desired quality, such as highway specifications, is all that is required by the claims. This is read on by the combination of references. By

optimizing both parameters such that highway specifications are met, sufficient stability and fatigue strength would exist to read on the applicant's claims. Additionally, since Walter teaches that the amount of asphalt controls the Hveem Stability and Goodrich teaches that the amount of polymer controls the Flexural Beam Fatigue, a cause-effective relationship is established that would make the results obvious and achievable through routine experimentation.

Applicant argues that Walter and Goodrich fail to teach making an interlayer, as required in the claims. This is not found convincing. Helf, the primary reference, explicitly teaches making an interlayer with a polymer-asphalt composition. Walter teaches that asphalt increases stability of asphalt compositions, while increases the risk of rutting at too high of a concentration. Goodson teaches that polymers provide fatigue resistance in polymer-asphalt compositions. Thus, Walter and Goodson provide motivation to optimize the materials taught by Helf to be used in making an interlayer.

Applicant argues that since Helf teaches "flexible aggregates", it is not properly combinable with Walter that only teaches mineral aggregates. This is not found convincing. Walter teaches that the aggregate may be rubber tires (column 3, lines 10-15), which reads on a flexible aggregate. Regardless, even if Walter did not teach the flexible aggregates, the specific type of aggregate does not alter the intrinsic property of asphalt being stable (strong) but susceptible to rutting in high concentrations. In combination, the flexible aggregates may relieve some of the rutting risk, but Walter envisions this in the teaching of not using too much asphalt.

Applicant argues that one would not look to Helf in order to improve Goodson because Goodson does not teach flexible aggregates. This is not found convincing. This is not the rejection on appeal. The rejection is based on looking to Goodson to improve Helf, not the other way, as applicant argues. Helf teaches polymer-asphalt compositions. Goodson teaches that the amount of polymer in a polymer-asphalt composition increases the fatigue life of the composition. This is motivation to determine the amount of polymer in the formulation taught by Helf.

Applicant alleges no expectation of success, but fails to give reasons why. This is not convincing. Hveem Stability tests and Flexural Beam Fatigue tests are known. To use them to determine the stability and flexibility of a product is obvious. To adjust formulations such that they meet some predetermined value for fatigue and stability would have been obvious. Since only the amount of polymer and asphalt is adjusted, there is no reason to believe that the proposed combination would not succeed.

Applicant argues that the "flexible aggregates" taught by Helf are different from that of the present invention. This is not found convincing. The claims do not exclude the aggregate from being flexible. Walter in column 3, lines 10-15, shows that using flexible aggregates is a relatively common concept known to those of ordinary skill in the art. Therefore, one of ordinary skill in the art would not interpret the claims as excluding flexible aggregates unless specifically stated in the claim. It is not.

Applicant argues that Helf teaches away from the present invention by teaching that the process may be used for making interlayers or surface courses. This is not found convincing. Helf does not teach using the same composition for both, just the

same procedure. Obviously, if the interlayer requires more flexibility, one of ordinary skill would have the ingenuity, in view of Goodson, to increase the amount of polymer in the formulation. Regardless, claim 37 does not require a specific predetermined amount of stability or fatigue life. Thus, Helf cannot teach away from the applicant's process.

Applicant argues that the since Walter and Goodrich do not teach interlayers, they would not be looked to and do not provide a reasonable expectation of success. This is not found convincing. Walter teaches an intrinsic property of asphalt that would be true in any formulation that comprises asphalt and a method of testing this property. Goodrich teaches an intrinsic property of polymers that are used in a polymer-asphalt composition and a method of testing this property. Since Helf teaches a composition that comprises asphalt and polymer, the combination certainly would be obvious and provides an expectation of success. The final product of Walter and Goodrich is trivial to the controllable properties and tests they teach.

As to claim 38:

Applicant argues that Walter teaches higher stability than that required by the claim. This is not found convincing. The claim requires a stability of **at least about** 18. As admitted by applicant, since Walter teaches higher stability, it must inherently read on "at least about 18". Regardless, in combination with Helf and Goodson, it is known that asphalt controls stability and polymer controls fatigue values. Charged with this

knowledge, one would have the ability to achieve a broad range of stability and fatigue values. Determining a specific value would merely be a design choice.

As to claim 39:

Applicant argues that Goodson does not teach the fatigue value. This is not found convincing. In combination with Helf and Walter, it is known that asphalt controls stability and polymer controls fatigue values. Charged with this knowledge, one would have the ability to achieve a broad range of stability and fatigue values. Determining a specific value would merely be a design choice. Specifically, since Goodson teaches a surface layer and Helf, the primary reference, is being used to produce an interlayer, one would understand that the amount of polymer should be altered for use in an interlayer, which typically is more flexible.

As to claim 42:

Applicant argues that Goodson does not teach formulating the composition based on the physical properties tested. This is not found convincing. It would be the duty of any design engineer to meet any design specifications and if the current formulation fails to meet these specifications, to alter subsequent formulations such that they do. What would be the point of testing anything if that data is not used to improved later formulations? Obviously, if the composition did not meet certain specifications, it would be thrown out and a new formulation would be made. Altering subsequent

formulations such that they meet a desired quality, such as highway specifications, is all that is required by the claims. This is read on by the combination of references.

As to claim 43:

Applicant argues that Goodson does not consider rotational viscosity. This is not found convincing. See column 7, lines 30-40. Many properties are taught, including viscosity. It would have been obvious to test for any property in which one wishes to control.

As to claim 44:

Applicant argues that Goodson does not consider volumetric testing. This is not found convincing. It would have been obvious to test for any property in which one wishes to control.

As to claims 45, 47, and 49-52:

These arguments parallel those above and are unconvincing for the same reasons as indicated originally. Using the formulation or make a roadway or to repair a roadway would have been obvious variations of each other, as it is known to use new material in repairing a roadway.

As to claim 54:

Applicant argues that the temperature before traffic is allowed to resume is not taught. This is not found convincing. To not allow traffic to resume until the roadway is completely set would have been obvious and reads on the applicant's range. To err on the side of caution and wait until the temperature is that of the atmosphere certainly reads on the applicant's range.

As to claim 55:

These arguments parallel those above and are unconvincing for the same reasons as indicated originally.

As to claim 56:

It would have been obvious to test for any property in which one wishes to control.

As to claim 57:

These arguments parallel those above and are unconvincing for the same reasons as indicated originally.

As to claim 58:

It would have been obvious to test for any property in which one wishes to control.

As to claim 59:

These arguments parallel those above and are unconvincing for the same reasons as indicated originally.

As to claim 48:

These arguments parallel those above and are unconvincing for the same reasons as indicated originally.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Eric Bradley Fuller

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